

I claim:

1. Double universal joint for transmitting uniform rotary motion from an input end-shaft to an output end-shaft having shaft axes intersecting with each other at a variable angle, comprising:

- the two end-shafts,
- ~~the~~ middle-shaft,
- an input intermediate element being connected pivotally
 - with the ~~one~~ ^{INPUT} end of said middle-shaft having input middle cross-axis intersecting perpendicularly the middle-shaft axis and
 - with said input end-shaft having ~~end~~ ^{INPUT} cross-axis intersecting perpendicularly the input end-shaft axis,
 - an output intermediate element being connected pivotally
 - with the ~~other~~ ^{OUTPUT} end of said middle-shaft having output middle cross-axis intersecting perpendicularly the middle shaft axis and
 - with said output end-shaft having ~~end~~ ^{OUTPUT} cross-axis intersecting perpendicularly the output end-shaft axis,

each two cross-axes intersecting perpendicularly with each other,

characterized with

- two input-swingers, rotatably mounted at ~~one~~^{THE INPUT} end of said middle-shaft about said input middle cross-axis,
- means for angle coupling of said two input swingers with the end of said input end-shafts, for turning of said two input-swingers at same direction about said input middle cross-axis when the input end-shaft is turning about said input middle cross-axis and for turning of said two input swingers at two opposite directions about said input middle cross-axis when the input end-shaft is turning about the ~~respective~~^{INPUT} end cross-axis,
- two output-swingers, rotatably mounted at the ~~other~~^{OUTPUT} end of said middle-shaft about said output middle cross-axis,
- means for angle coupling of said two output-swingers with the end of said output end-shaft, for turning of said two output-swingers at same direction about said output middle cross-axis when the output end-shaft is turning about said output middle cross-axis and for turning of said two output swingers at two opposite directions about said output middle cross-axis when the output end-shaft is turning about the ~~respective~~^{OUTPUT} end cross-axis,
- means for parallel coupling of each input-swingers with the respective output-swingers located at the same side of the middle-shaft

axis, for symmetrically transmitting of each input end-shaft direction to the output end-shaft direction for transmitting of uniform motion.

2. Double universal joint for transmitting uniform rotary motion from an input end-shaft (1) to an output end-shaft (2) having shaft axes (40, 42) intersecting with each other at a variable angle, comprising:

- the two end-shafts (1, 2),
- ~~the~~ middle-shaft (3),
- an input pivot-cross being connected pivotally
 - with the ~~one~~ ^{input} end of said middle-shaft (3) having input middle cross-axis (46) intersecting perpendicularly the middle-shaft axis (41) and
 - with said input end-shaft (1) having end cross-axis (45) intersecting perpendicularly the input end-shaft axis (40),
 - an output pivot-cross being connected pivotally
 - with the ~~other~~ ^{output} end of said middle-shaft (3) having output middle cross-axis (48) intersecting perpendicularly the middle shaft axis (41) and
 - with said output end-shaft (2) having end cross-axis (47) intersecting perpendicularly the output end-shaft axis (42), each two cross-axes (45, 46 and 47, 48) intersecting perpendicularly with each other,

characterized with

- two input-swingers (26,27), rotatably mounted at ~~one~~^{the input} end of said middle-shaft (3) about said input middle cross-axis (46),
 - bevel teeth (36, 37) mounted on each of said two input swingers (26, 27) and bevel teeth (34) mounted on ~~each~~^{the} input end-shafts (1) being coupled with the bevel teeth of each input-swingers (26,27), for turning of said two input-swingers (26, 27) at same direction about said input middle cross-axis (46) when the input end-shaft (1) is turning about said input middle cross-axis (46) and for turning of said two input swingers (26, 27) at two opposite directions about said input middle cross-axis (46) when the input end-shaft (1) is turning about the ~~input~~^{respective} end cross-axis (46),
- two output-swingers (28, 29), rotatably mounted at the ~~other~~^{output} end of said middle-shaft (3) about said output middle cross-axis (48),
 - bevel teeth (38, 39) mounted on each of said two output-swingers (28, 29) and bevel teeth (35) mounted on ~~each~~^{the} output end-shaft (2),
~~but~~ ~~coupled with the bevel teeth (28,29) of each output-swingers~~ for turning of said two output-swingers (28, 29) at same direction about said output middle cross-axis (48) when the output end-shaft (2) is turning about said output middle cross-axis (48) and for turning of said two output swingers (28, 29) at two opposite directions about said output middle cross-axis (48) when the output end-shaft (2) is turning about the ~~respective~~^{output} end cross-axis (48),

input - parallel teeth ~~coupling~~ (30, 31) and ~~32, 33~~ of each input-swinger mounted on ~~for coupling~~ output parallel teeth (32, 33) of the (26, 27) with the respective output-swinger (28, 29) located at the same side of the middle-shaft axis (41) for symmetrically transmitting of each input end-shaft direction to the output end-shaft direction for transmitting of uniform motion.